Math 212
Quiz 07

W 07 Sep 2016

Your name: _____

Exercise

(2 pt) Recall that the arc length of the graph of a function $y = f(x)$ in $\mathbf{R}^2$ can be written

$$L = \int_a^b \sqrt{1 + (f'(x))^2}dx.$$

(a) (1 pt) View $f'(x)$ as $\frac{dy}{dx}$, and distribute dx under the square root. What do you obtain?

(b) (1 pt) View the graph of $y = f(x)$ as the vector-valued function $\mathbf{r}(t) = (x, y)$, where we can view x and y as functions of t (e.g., $x(t) = t, y(t) = f(t)$). Write the integral for arc length in terms of a norm related to $\mathbf{r}$. *Hint:* Consider part (a).